

SWBAT: discover Ohm's Law

Jan 4-7:20 AM

Welcome!!!

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SECA Physics
Friday 27 March 2015

* Pick up:

- slip of paper (for later)
- yellow concept sheet from the shelf


Opening Questions:


What's the difference between R, A, C, I, and Ω ?

Centering

Sep 7-7:04 AM

Concept sheet: 6 rows total

Bike				
Concept	Meaning	Symbol	Units	Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	
VOLTAGE =ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $V = \frac{J}{C}$	-PERSON -PEDALING \Rightarrow THE PUSH
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{1s}$	-WHEEL CHAINS MOVING
RESISTANCE	OPPOSITION OF CURRENT "AGAINST THE FLOW"	R	OHMS Ω	BRAKES



Feb 23-7:34 AM

Current, Voltage, and Resistance: The Bicycle Analogy

If I were to pedal a bike while gently squeezing the hand brakes, what in that situation would be like
current?
voltage?
resistance?

I : WHEELS, CHAIN, MOVING
 V : PUSH
 R : BRAKES



Mar 7-7:33 AM

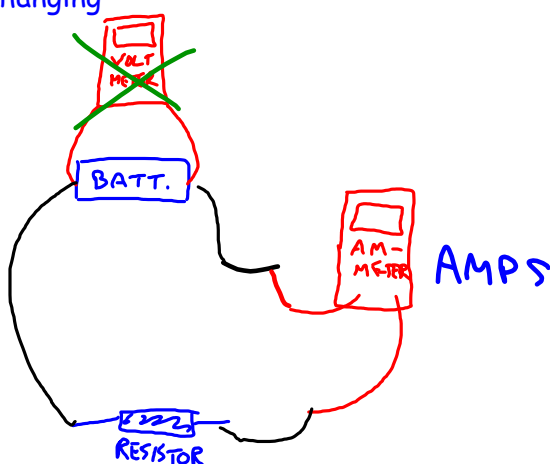
BASE LEVEL VOLTAGE Pedaling Effort	BASE LEVEL RESISTANCE Braking	BASE SPEED CURRENT Speed of bike?
Same	More	SLOWER
Same	Less	FASTER
More	Same	FASTER
Less	Same	SLOWER

Feb 23-7:43 AM

Gathering our experiment data!

- * Each group: 1 or 2 students do simulation lab
 - follow directions on the sheet
- * Each group: 2-3 students use the equipment
 - use the diagram below
 - choose a team name
 - let me know what you are changing

SAFETY
RULE:
IF BATTERY
GETS HOT,
STOP IT




Mar 8-7:43 AM

TEAM	TRIAL 1 or 2	V(V)	R(Ω)	\times I (A)	= VOLTAGE
LaDonna	1	1.55V	8 Ω	0.4A	1.12
	2	1.59V	50 Ω	0.03A	1.5
	3	2.9V	50 Ω	0.06A	3

Dec 13-8:21 AM

Concept sheet: 6 rows total

Concept	Meaning	Symbol	Units	Bike Analogy
CHARGE	PROPERTY OF PROTONS & ELECTRONS THAT CAUSES ATTRACTION & REPULSION	q	COULOMBS C	
VOLTAGE = ELECTRIC POTENTIAL	POTENTIAL BASED ON POSITION IN AN ELECTRIC FIELD "PUSH"	V	VOLTS V $1V = \frac{1J}{1C}$	PERSON PEDALING \Rightarrow THE PUSH
CURRENT	THE FLOW OF ELECTRIC CHARGE $= \frac{\text{CHARGE}}{\text{TIME}}$	I $I = \frac{q}{t}$	AMPERE A $1A = \frac{1C}{1s}$	- WHEEL CHAINS MOVING
RESISTANCE	OPPOSITION OF CURRENT "AGAINST THE FLOW"	R	OHMS Ω	BRAKES
OHM'S LAW	VOLTAGE = CURRENT TIMES RESISTANCE	$V = I \cdot R$	$1V = 1A \cdot 1\Omega$	HOW HARD DO YOU PEDAL? BRAKE AFFECTS SPEED

$$\triangle \frac{q}{I \cdot t}$$

$$\triangle \frac{V}{I \cdot R}$$

Feb 23-7:34 AM

Practice Ohm's Law!

VOLTAGE = CURRENT \times RESISTANCE

$$V = I \cdot R$$

Current = 2 A

Resistance = 4 ohms

What's voltage?

$$V = I \cdot R = 2A \cdot 4\Omega = 8V$$

Mar 9-7:31 AM

Daily 3 Questions

CP - No homework

- * Every day except test/project days
- * 3 Questions on the topics of the day
- * Main source of daily points
- * I am happy to give credit when I have no concerns about someone giving or getting help with the answers.

You can't get your points if you don't have your NAME!!!

Name	Period
1.	
2.	
3.	

Sep 9-7:32 AM

1. What are the **units** for resistance?

Ω OHMS

2. Did our predictions for our circuits (generally) match our results?

YES!

3. What is the formula for Ohm's Law (in words or symbols) relating voltage, current, and resistance?

$V = I \cdot R$ or VOLTAGE = CURRENT
X RESISTANCE

Feb 18-6:59 AM

Feb 27-10:28 AM